

COLD SPRAY APPARATUS HAVING POWDER PREHEATING DEVICE**ABSTRACT**

A cold spray apparatus having a powder preheating device, capable of obtaining high deposition rate and excellent coating layer under the same spray processing conditions by preheating coating powder before a coating process. Also, a manufacturing method of nano-structured super-high hardness WC-Co coating having high abrasive wear resistance and fracture toughness obtained by spraying WC-Co powder using the cold spray apparatus. In the cold spray apparatus, a gas controller controls gas supply amount of main gas and residual gas (gas that is not supplied toward the main gas), and a gas heater heats the main gas supplied under the control of the gas controller. A powder feeder receives the residual gas under the control of the gas controller and supplies a coating powder together with the residual gas. A powder preheating device preheats the coating powder supplied from the powder feeder, and a mixing chamber mixes the heated main gas with the preheated coating powder. A temperature controller adjusts temperature by controlling the powder preheating device and the gas heater, and the coating powder mixed in the mixing chamber is sprayed through a nozzle.